WHAT IS CLAIMED IS:

1. A VSB reception system for receiving and decoding an input signal comprising an MPEG data segment and a supplemental data segment transmitted from a VSB transmission system, the VSB reception system comprising:

a sequence generator for decoding a symbol corresponding to the supplemental data segment and generating a predefined sequence encoded with the supplemental data segment;

a modified legacy VSB receiver for processing the input signal received from the VSB transmission system in a reverse order of the VSB transmission system and outputting a derandomized data signal;

a demultiplexer for demultiplexing the derandomized data signal from the modified legacy VSB receiver into the MPEG data segment and an encoded supplemental data segment; and

a supplemental data processor for decoding the encoded supplemental data segment from the demultiplexer to obtain the supplemental data segment.

2. A VSB reception system of claim 1, wherein the sequence generator includes:

a multiplexer for receiving and multiplexing a supplemental data dummy packet and an MPEG data dummy packet and outputting as a multiplexer output signal;

a randomizer for randomizing the multiplexer output signal;

a parity inserter for inserting dummy bytes to randomized data;

a data interleaver for interleaving an output of the parity inserter; and

a trellis coder for converting interleaved data to symbols and outputting the converted symbols without subjecting to trellis coding.

3. A VSB reception system of claim 2, wherein the trellis coder includes a plurality of coders and precoders for receiving the symbols and forwarding the symbols without subjecting to precoding and coding.

4. A VSB reception system of claim 3, wherein the symbols from the trellis coder includes two bits D1 and D0, wherein if the bit D1 is at a first logic level, a symbol corresponds to a supplemental data symbol, and if the bit D1 is at a second logic level, the symbol is an MPEG data symbol, and when the bit D1 is at the first logic level, the bit D0 is the predefined sequence being used to decode the supplemental data segment.

5. A VSB reception system of claim 2, wherein the randomizer subjects the output signal of the multiplexer using pseudo random bytes and 0x55 to a bit-wise AND logical operation, and a result of the AND logical operation and input bits from the multiplexer to a bit-wise exclusive OR logical operation.

6. A VSB reception system of claim 2, wherein the dummy bytes correspond to the 20 parity bytes are dummy bytes of 0x00, and the MPEG data dummy packet produces 187 dummy bytes of 0x00, and the supplemental data dummy packet produces three dummy bytes of 0x00 corresponding to the MPEG header bytes, and 184 dummy bytes of 0xAA corresponding to the supplemental data packet.

7. A VSB reception system of claim 1, wherein the modified legacy VSB receiver includes:

a demodulator for receiving the input signal through and converting the input signal into a base band signal, and recovering a segment synchronizing signal, a field synchronizing signal, and a symbol timing from the base band signal;

a comb filter for removing an NTSC interference signal from an output signal of the demodulator, if the NTSC interference signal is detected;

a slicer predictor for providing a slicer prediction signal and a prediction reliability signal by using a predefined sequence from the sequence generator;

a channel equalizer for correcting a distorted channel in an output signal of the comb filter by using the slicer prediction signal, the prediction reliability signal and the predefined sequence and outputting a channel equalizer output signal;

a phase tracker for correcting a phase of an output signal of the channel equalizer by using the predetermined sequence and the slicer prediction signal;

a trellis decoder for decoding an output of the phase tracketer using Viterbi algorithm and the predefined sequence received from the sequence generator;

a data deinterleaver for deinterleaving a trellis decoder output signal;

a Reed-Solomon decoder for decoding a Reed-Solomon coded signal outputted from the data deinterleaver; and

a data derandomizer for derandomizing a Reed-Solomon decoder output signal.

8. A VSB reception system of claim 7, wherein the Reed-Solomon decoder of the modified legacy VSB receiver removes 20 parity bytes without subjecting the supplemental data segment to Reed-Solomon decoding.

9. A VSB reception system of claim 7, wherein the demultiplexer demultiplexes the derandomized data signal from the modified legacy VSB receiver into the MPEG data segment and the encoded supplemental data segment by using the a multiplexing information signal detected from the field synchronizing signal.

10. A VSB reception system of claim 1, wherein the supplemental data processor includes:

an MPEG header remover for removing three MPEG header bytes from the supplemental data segment received from the demultiplexer;

a null sequence remover for removing the null sequence inserted to the supplemental data packet; and

a Reed-Solomon decoder for subjecting a null sequence remover output to Reed-Solomon decoding.

11. A VSB reception system of claim 10, further comprising a deinterleaver between the null sequence remover and the Reed-Solomon decoder for deinterleaving the null sequence remover output.

12. A VSB reception system of claim 7, wherein the channel equalizer includes:

a plurality of slicers each having a predetermined signal level detector;

a feed-forward filter for receiving a comb filter output signal;

a feedback filter for receiving an output signal of one of the plurality of slicers;

an adder for adding output signals of the feed-forward filter and the feedback filter and outputting an added signal as a channel equalizer output signal, wherein the plurality of slicers commonly receive the added signal;

a multiplexer for outputting one of the outputs of the plurality of slicers to the feedback filter in response to a control signal; and

a controller for updating filter coefficients of the feed-forward filter and the feedback filter and providing the control signal to the multiplexer in response to a multiplexer output signal, the slicer prediction signal, and the prediction reliability signal, the channel equalizer output signal and the predefined sequence to select the multiplexer to output signal from one of the plurality of slicers that has the predetermined signal level detector closes to the comb filter output signal.

13. A VSB reception system of claim 12, wherein the slicer predictor receives the channel equalizer output signal, the predefined sequence generated from the sequence generator and information that the symbol received is of the supplemental data packet, estimates a register value of the trellis coder, calculates prediction reliability, and forwards the estimated register value to the controller of the channel equalizer.

14. A VSB reception system of claim 13, wherein the plurality of slicers includes first to third slicers for processing MPEG data symbols, and fourth to ninth slicers for processing the supplemental data symbols, wherein the first slicer has 8 level values of –7, -5, -3, -1, +1, +3, +5,

+7, the second slicer has 4 level values of –7, -3, +1, +5, the third slicer has 4 level values of -5, -1, +3, +7, the fourth slicer has 4 level values of –7, -5, +1, +3, the fifth slicer has 4 level values of -3, -1, +5, +7, the sixth slicer has 2 level values of –7, +1, the seventh slicer has 2 level values of -5, +3, the eighth slicer has 2 level values of -3, +5, and the ninth slicer has 2 level values of -1, +7.

15. A VSB reception system of claim 14, wherein –7 denotes 000, -5 denotes 001, -3 denotes 010, -1 denotes 011, +1 denotes 100, +3 denotes 101, +5 denotes 110, and +7 denotes 111.

16. A VSB reception system of claim 14, wherein, with respect to the MPEG data symbols, the first slicer is selected in a low reliability case, the second slicer is selected for a high reliability case and the estimated register value is at a first logic level, and the third slicer is selected for a high reliability case and the estimated register value is at a second logic level.

17. A VSB reception system of claim 14, wherein, with respect to the supplemental data symbols;

one of the fourth slicer and the fifth slicer is selected in response to the predefined sequence for a low reliability case;

the sixth slicer is selected for a high reliability case and the predefined sequence value and the estimated register value are at a first logic level;

the seventh slicer is selected for a high reliability case and the predefined sequence value is at a first logic level and the estimated register value is at a second logic level;

the eighth slicer is selected for a high reliability case and the predefined sequence value is at a second logic level and the estimated register value is at a first logic level; and

the ninth slicer is selected for a high reliability case and the predefined sequence value and the estimated register value are at a second logic level.

18. A VSB reception system of claim 1, wherein the sequence generator is responsive in synchronous to the field synchronizing signal.

19. A VSB reception system for receiving and decoding an input signal comprising an MPEG data segment and a supplemental data segment transmitted from a VSB transmission system, the VSB reception system comprising:

a modified legacy VSB receiver for processing the input signal received from the VSB transmission system in a reverse order of the VSB transmission system and outputting a derandomized data signal;

a demultiplexer for demultiplexing the derandomized data signal from the modified legacy VSB receiver into the MPEG data segment and an encoded supplemental data segment; and

a supplemental data processor for decoding the encoded supplemental data segment from the demultiplexer to obtain the supplemental data segment, wherein the supplemental data processor includes:

an MPEG header remover for removing three MPEG header bytes from the supplemental data segment received from the demultiplexer;

a null sequence remover for removing the null sequence inserted to the supplemental data packet; and

a Reed-Solomon decoder for subjecting a null sequence remover output to Reed-Solomon decoding.

20. A VSB reception system of claim 19, wherein the modified legacy VSB receiver includes:

a demodulator for receiving the input signal through and converting the input signal into a base band signal, and recovering a segment synchronizing signal, a field synchronizing signal, and a symbol timing from the base band signal;

a comb filter for removing an NTSC interference signal from an output signal of the demodulator, if the NTSC interference signal is detected;

a slicer predictor for providing a slicer prediction signal and a prediction reliability signal by using a predefined sequence from the sequence generator;

a channel equalizer for correcting a distorted channel in an output signal of the comb filter by using the slicer prediction signal, the prediction reliability signal and the predefined sequence and outputting a channel equalizer output signal;

a phase tracker for correcting a phase of an output signal of the channel equalizer by using the predetermined sequence and the slicer prediction signal;

a trellis decoder for decoding an output of the phase tracketer using Viterbi algorithm and the predefined sequence received from the sequence generator;

a data deinterleaver for deinterleaving a trellis decoder output signal;

a Reed-Solomon decoder for decoding a Reed-Solomon coded signal outputted from the data deinterleaver; and

a data derandomizer for derandomizing a Reed-Solomon decoder output signal.

21. A VSB reception system of claim 20, wherein the Reed-Solomon decoder of the modified legacy VSB receiver removes 20 parity bytes without subjecting the supplemental data segment to Reed-Solomon decoding.

22. A VSB reception system of claim 19, wherein the demultiplexer demultiplexes the derandomized data signal from the modified legacy VSB receiver into the MPEG data segment and the encoded supplemental data segment by using the a multiplexing information signal detected from the field synchronizing signal.

23. A VSB reception system of claim 21, wherein the demultiplexer demultiplexes the derandomized data signal from the modified legacy VSB receiver into the MPEG data segment and the encoded supplemental data segment by using the a multiplexing information signal detected from the field synchronizing signal.

24. A VSB reception system of claim 19, further comprising a deinterleaver between the null sequence remover and the Reed-Solomon decoder for deinterleaving the null sequence remover output.